

Claims:

1. A process for preparing an aqueous dispersion of polymer particles, said process comprising the steps of:

a) preparing an aqueous emulsion of hydrophobic monomer droplets, said droplets comprising:

i) at least one C₈ to C₃₀ alkyl (meth)acrylate monomer,

ii) at least one chain branching monomer, said chain branching monomer present in an amount not greater than 0.10 weight percent based on total weight of the C₈ to C₃₀ alkyl (meth)acrylate monomer, and

iii) at least one emulsifier; and

b) polymerizing said C₈ to C₃₀ alkyl (meth)acrylate monomer with said chain branching monomer using at least one free radical initiator, wherein said chain branching monomer results in the polymer particles comprising non-gelled polymer chains, and wherein said non-gelled polymer chains have a weight average molecular weight of at least 100,000 g/mol.

2. The process according to Claim 1, wherein the polymer particles further comprise at least one hard phase and at least one soft phase, wherein said hard phase is provided external to each of said polymer particles.

3. The process according to Claim 2, wherein said at least one hard phase comprises at least one hard polymer shell, said hard polymer shell having at least one glass transition temperature of at least 25°C, wherein said hard polymer shell is provided by polymerizing at least one ethylenically unsaturated monomer in the presence of the polymer particles.

4. The process according to Claim 3, wherein said at least one hard polymer shell comprises an inner polymer shell and an outer polymer shell, wherein said inner polymer shell is situated adjacent to each of said polymer particles, and said outer polymer shell is situated external to said inner polymer shell, wherein said inner polymer shell is provided by polymerizing at least one ethylenically unsaturated monomer in the presence of the polymer particles, and said outer polymer shell is provided by subsequently polymerizing at least one ethylenically unsaturated monomer in the presence of the combination of the polymer particles and said inner polymer shell.

5. The process according to Claim 3, further comprising the step of adding a plurality of second polymer particles to the aqueous dispersion of polymer particles, wherein the second polymer particles are situated external to said hard polymer shell.

6. The process according to Claim 2, wherein said at least one hard phase comprises a plurality of second polymer particles.

7. The process according to Claim 1, further comprising the step of reducing the amount of unpolymerized monomers using at least one of the following: t-alkyl hydroperoxide, t-alkyl peroxide, and t-alkyl perester, wherein the t-alkyl group includes at least 5 carbon atoms; and optionally at least one other oxidant.

8. The process according to Claim 1, wherein said aqueous emulsion of hydrophobic monomer droplets is prepared using high shear means to provide a mean droplet diameter of less than 30 microns.

9. The process according to Claim 1, wherein said aqueous emulsion of hydrophobic monomer droplets further comprises at least one hydrophobic monomer carrier.

10. The process according to any one of Claims 1 to 9, further comprising at least one step to remove water from said aqueous dispersion of polymer particles, so that said polymer particles are in the form of at least one of the following: a wetcake, powder, tablet, pellet, bead, film, and extrudate.